FINAL

REMEDIAL ACTION COMPLETION REPORT

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE
OPERABLE UNIT -1

SOUTH PLAINFIELD, NEW JERSEY

Contract Number W912DQ-05-D-0001
Task Order 001

Prepared for:

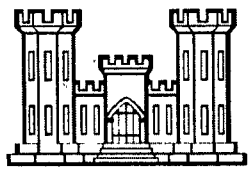

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

TABLE OF CONTENTS

APPENDICES (continued)

LIST OF ACRONYMS AND ABBREVIATIONS

APP	Accident Prevention Plan
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
ATP	Authority to Proceed
bgs	below ground surface
CDE	Cornell-Dubilier Electronics
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CHSM	Corporate Health and Safety Manager
CQC	Contractor Quality Control
CQCP	Contractor Quality Control Plan
CQCSM	Contractor Quality Control Systems Manager
CRZ	Contaminant Reduction Zone
CY	cubic yard
dBA	decibels on the A-weighted scale
DFW	definable feature of work
DGA	dense graded aggregate
DQCR	Daily Quality Control Report
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ESCP	Erosion and Sedimentation Control Plan
EZ	Exclusion Zone
FSP	Field Sampling Plan
FW	Foster Wheeler
GEL	General Engineering Laboratories
HazWOPER	Hazardous Waste Operations and Emergency Response
HVAC	heating, ventilation, and air conditioning
Kemron	Kemron Environmental Services
Langan	Langan Associates
mg/kg	milligrams per kilogram
MT	Materials Testing, Inc.

NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
OU	operable unit
PCB	polychlorinated biphenyl
PM	Project Manager
PPE	personal protective equipment
PPM	part per million
psi	pounds per square inch
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RACR	Remedial Action Completion Report
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
S&H	safety and health
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SHM	Safety and Health Manager
SOW	scope of work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOC	semivolatile organic compounds
T&D	transportation and disposal
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compounds
WMP	Waste Management Plan

WSG	Waste Solutions Group
WVN	Work Variance Notification

1.0 INTRODUCTION

This Remedial Action Completion Report (RACR) for the Cornell-Dubilier Electronics (CDE) Superfund site, South Plainfield, New Jersey, is being submitted by CAPE to the U.S. Army Corps of Engineers (USACE), Kansas City District in partial fulfillment of Contract Number W912DQ-05-D-0001, Contract Task Order No. 001.

The objective of this RACR is to document the procedures used to implement the selected remedial actions presented in the U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) for the CDE Superfund site, South Plainfield, New Jersey (EPA Identification Number: NJD981557879; Operable Unit [OU] 1), September 30, 2003, for four of the sixteen residential properties in the vicinity of the former CDE facility. The remedial actions were chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act, as amended (CERCLA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

This document is augmented by the following appendices:

- A – U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) Abstract for the Cornell-Dubilier Electronics Site, South Plainfield, New Jersey
- B – Remedial Investigation Data
- C – Remedial Investigation Data
- D – Remedial Investigation Data
- E – Remedial Investigation Data
- F – Permits
- G – Technical Memorandums 001, 002, & 003: Additional Sampling for OU-1 Remedial Action Properties
- H – Data Quality Assessment, Analytical Laboratory Reports, and HAZSITE & Metadata Electronic Data Submittals
- I – Photographs
- J – As-Built Drawings
- K – Materials Testing Reports
- L – Transportation and Disposal Documentation
- M – Final Schedule
- N – Daily Quality Control Reports
- O – Maxxam Analytics Air Monitoring Data

- P – Construction Releases and Inspection Documentation.

1.1 Operable Unit 01 Description and Background

The CDE site is located at 333 Hamilton Boulevard in South Plainfield, Middlesex County, New Jersey (Figures 1.1-1 and 1.1-2). The Site includes four OUs. OU1 consists of residential, commercial, and municipal properties located in the vicinity of the former CDE facility. OU2 addresses contaminated soils and buildings at the former CDE facility. OU3 addresses contaminated groundwater, and OU4 addresses the contaminated sediments of the Bound Brook.

The former CDE facility, now known as the Hamilton Industrial Park, consists of approximately 26 acres. The facility is bordered on the northeast by the Bound Brook and the former Lehigh Valley Railroad, Perth Amboy Branch (presently Conrail); to the southeast by the South Plainfield Department of Public Works property, which includes an unnamed tributary to the Bound Brook; to the southwest, across Spicer Avenue, by single-family residential properties; and to the northwest, across Hamilton Boulevard, by mixed residential and commercial properties. Figure 1.1-1.

CDE operated at the facility from 1936 to 1962, manufacturing electronic components including, in particular, capacitors. Polychlorinated biphenyls (PCBs) and chlorinated organic solvents were used in the manufacturing process, and during CDE's period of operation, the company disposed of PCB-contaminated materials and other hazardous substances at the site. These activities evidently led to widespread chemical contamination at the facility, as well as migration of contaminants to areas nearby. PCBs have been detected in the groundwater, soils, and in building interiors at the industrial park; at adjacent residential, commercial, and municipal properties; and in the surface water and sediments of the Bound Brook. High levels of volatile organic compounds (VOCs) have been found in the facility soils and in groundwater. Since CDE's departure from the facility in 1962, it has been operated as a rental property, with more than 100 commercial and industrial companies operating at the facility as tenants.

The Selected Remedy described in the ROD, which is the focus of this document, involves the remediation of PCB contaminated soil found on residential, commercial, and municipal properties located in the vicinity of the former CDE facility. The properties scheduled for remediation included the following locations:

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-
-
-

1.2 Project Objectives

As identified in the ROD, remedial action objectives are specific goals to protect human health and the environment. The following remedial action objectives for contaminated soil and indoor dust will address the human health risks and environmental concerns at residential, commercial, and municipal properties in the vicinity of the CDE facility:

- Reduce or eliminate the direct contact threat associated with contaminated soil and indoor dust to levels protective of current land use and considering the future residential use. Note that the actions described in this RACR only address PCB-contaminated soil. Interior dust contamination was previously addressed by another contractor

- Prevent exposure and minimize disturbance to the surrounding community of South Plainfield during implementation of the remedial action.

The EPA is using 1 part per million (ppm) as the Remediation Goal for this action. The state of New Jersey has developed a Residential Direct Contact Soil Cleanup Criteria (RDCSCC) for PCBs of 0.49 ppm. Because this is not a promulgated standard, it is not an applicable or relevant and appropriate requirement (ARAR) but rather a "To Be Considered" criterion. Because the New Jersey criterion is more conservative, it was considered when reviewing sample results.

1.3 Initial Assessment

Four properties were identified in the September 2003 ROD as requiring the excavation and off-site disposal of PCB-contaminated soil. Three of the properties were sampled during the Remedial Investigation (RI) performed for OU1 by Foster Wheeler (FW). The Final RI Report for these properties was submitted in August 2001 (FW, 2001). The fourth property was sampled as part of the Tier I Residential Sampling Event performed by Roy F. Weston in 1997, and the report was submitted in 1998 (Weston, 1998b). A brief discussion of the RI and Tier I activities performed at the four residential properties selected for remedial action is included for each property in Section 3.

1.4 Overview of Remedial Actions

1.4.1

In November 2005, CAPE established the initial limits of excavation using the RI data collected in June 2000. After the soil was excavated, CAPE collected sidewall and bottom pre-excavation confirmation samples in accordance with the New Jersey Administrative Code (NJAC) 7:26 and backfilled the excavation. Immunossay field test kits were used by CAPE to define the extent of contamination. In addition, confirmation soil samples were sent to Kemron Environmental Services (Kemron) for PCB analysis. Laboratory analysis of these samples showed that some samples exceeded the cleanup criteria for the site and that additional excavation was required. Refer to Technical Memorandum 003 (Appendix G). CAPE collected additional pre-excavation confirmation samples from July 2006 through March 2007 and used the results to excavate an additional portion of the property in April 2007, as described in Section 3.1.

1.4.2

In November 2005, CAPE established the initial limits of excavation using the RI data collected in June 2000. After the soil was excavated, CAPE collected sidewall and bottom pre-excavation confirmation samples in accordance with the NJAC 7:26 and

backfilled the excavation. Immunossay field test kits were used by CAPE to define the extent of contamination. In addition, confirmation soil samples were sent to Kemron for PCB analysis. Laboratory analysis of these samples showed that some samples exceeded the cleanup criteria for the site and that additional excavation was required. Refer to Technical Memorandum 003 (Appendix G). CAPE collected additional pre-excavation confirmation samples from July 2006 through October 2006 and used the results to excavate three additional areas on the property in April 2007, as described in Section 3.2.

1.4.3

In November 2005, CAPE established the initial limits of excavation using the RI data collected in June 2000. After the soil was excavated, CAPE collected sidewall and bottom pre-excavation confirmation samples in accordance with the NJAC 7:26 and backfilled the excavation. Immunossay field test kits were used by Cape to define the extent of contamination. In addition, confirmation soil samples were sent to Kemron for PCB analysis. Laboratory analysis of these samples showed that some samples exceeded the cleanup criteria for the site and that additional excavation was required. Refer to Technical Memorandum 003 (Appendix G). CAPE collected additional pre-excavation confirmation samples from July 2006 through October 2006 and used the results to excavate four additional areas on the property in April 2007, as described in Section 3.2.

1.4.4

CAPE established the initial limits of excavation using the FW data from June 2000. CAPE collected pre-excavation confirmation samples from the proposed excavation areas from July 2006 through October 2006, and Kemron analyzed the samples for PCBs. Based on those results, excavation of the PCB-contaminated soil began in April 2007. Seven distinct areas were excavated and backfilled as described in Section 3.4.

2.0 PROJECT PLANNING AND PREMOBILIZATION ACTIVITES

2.1 Records Review and Work Plan Preparation

CAPE reviewed all known applicable federal, state, and local laws and regulations regarding handling potentially contaminated material to protect site personnel, the public, and the environment. All elements of these laws and regulations were adhered to by CAPE and its subcontractors during the performance of this contract.

Before mobilization, CAPE prepared the following plans in accordance with the project SOW:

Work Plan

The Work Plan described CAPE's proposed plan to complete the tasks required by the SOW. The information provided in this plan detailed the work to be completed and outlined the details related to each task by organizing the project by definable feature of work (DFW).

Environmental Protection Plan

The Environmental Protection Plan (EPP) was part of the Work Plan. It established the procedures and systems that CAPE used to comply with environmental protection requirements. The EPP was implemented during construction activities to (1) protect public safety and natural resources, (2) provide for proper disposal of contaminated materials and waste, and (3) clean up and remove trash and debris from the site. The EPP provided site-specific information for:

- Contaminant prevention and spill control
- Air pollution prevention
- Protection of trees and shrubs
- Wetlands protection
- Historical, archeological, and cultural resources protection.

Soil Erosion and Sedimentation Control Plan

The Soil Erosion and Sedimentation Control Plan (ESCP) was a stand-alone drawing that identified the type and location of the erosion and sediment controls required at the sites. The plan also included monitoring and reporting requirements to ensure compliance with local, state, and federal laws. The plan was submitted to the Freehold Soil Conservation District for to obtain an ESCP certification, and on December 5, 2006, CAPE received authorization to proceed with the land disturbances associated with the project. The properties at were exempt from this requirement because the excavations were less than 5,000 square feet in size. All work was performed in accordance with the ESCP at Copies of the land disturbance permit documentation are included in Appendix F.

Waste Management Plan

The Waste Management Plan (WMP) was part of the Work Plan and provided a detailed description of the handling practices for wastes resulting from the execution of this project. The WMP detailed handling and management of non-hazardous and hazardous waste, transportation and reporting requirements, details regarding anticipated waste streams, and disposal requirements.

Contractor Quality Control Plan

The Contractor Quality Control (CQC) Plan was part of the Work Plan and described CAPE's proposed procedures for inspections, monitoring, follow-up, and corrective actions for all phases of work. The information provided in this plan ensured compliance with quality and schedule goals and applicable statutory and regulatory requirements.

Sampling and Analysis Plan

A Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP) were incorporated into the Sampling and Analysis Plan (SAP). The FSP provided guidance for the field sampling activities by defining in detail the sampling and data-gathering methods that were implemented during soil sampling activities. The FSP defined the sampling protocols in accordance with New Jersey Department of Environmental Protection (NJDEP) and federal standards. The QAPP described the policy, organization, functional activities, and quality assurance/quality control (QA/QC) protocols necessary to achieve the data quality objectives for this project.

Accident Prevention Plan

The Accident Prevention Plan (APP) provided an overview of CAPE's accident prevention program and requirements. The APP served as the primary safety and health (S&H) guidance for CAPE operations for this project.

Site Safety and Health Plan

The Site Safety and Health Plan (SSHP) was an attachment to the APP and provided site-specific facility information on waste types and characteristics, potential types of hazards, required protection levels, required monitoring and equipment, and emergency procedures. The SSHP:

- Provided background information related to the project, including identification of contaminants of concern
- Assigned responsibilities for SSHP implementation
- Identified site hazards and hazard control measures
- Described the exposure monitoring program
- Established requirements for site control and personal protective equipment (PPE)
- Discussed standard safety procedures and designates emergency response plans
- Reviewed training, medical surveillance, and recordkeeping programs to be implemented at the site.

2.2 Preconstruction Meeting

A preconstruction meeting was held on November 3, 2005. Representatives of the EPA, USACE, and CAPE attended the meeting. Pete Mannino, Remedial Project Manager (RPM), represented the EPA. Eugene Urbanik (Area Engineer), Neal Kolb (Resident Engineer), and Patrick Nejand (Project Engineer) represented the USACE. CAPE was represented by the following personnel: Michael Lamon (Project Manager), Charles Reed (Contractor Quality Control Systems Manager [CQCSM]), Jim Stewart (Site Superintendent), and Ken Beatty (Site Safety & Health Officer [SSHO]). The meeting covered a range of topics including contractual information, USACE and CAPE chain of command, correspondence, subcontracts, payments, QC, S&H, and project schedule.

A subsequent preconstruction meeting was held on March 15, 2007. Representatives of the EPA, USACE, and CAPE attended the meeting. Pete Mannino, RPM, represented the EPA. Dino Vizzoca (Construction Representative) and Patrick Nejand (Project Engineer) represented the USACE. CAPE was represented by the following personnel: Charlie McNeil (Site Superintendent), Robert Landle (CQCSM), and Paul Ferroni (Assistant Project Manager).

2.3 Contractor Selection

CAPE retained the following subcontractors/vendors to complete portions of the field activities:

- Williams Scotsman – Trailer Rentals
- WTDI – Non-hazardous Waste Transportation and Disposal (2005)
- Waste Solutions Group - Non-hazardous Waste Transportation & Disposal (2007)
- Waste Management - Dumpster
- Tabasco Drilling- Geoprobe Drilling
- Hertz - Heavy Equipment Supplier
- Binder Machinery – Heavy Equipment Supplier
- Foley Rents - Heavy Equipment Supplier
- United Rentals – Small Equipment Supplier
- Rent Rite – Small Equipment Supplier
- Maddox Materials – Stone & Backfill Supplier
- Weldon Materials – Stone & Concrete Supplier
- Country View Landscaping – Topsoil Supplier
- TomKat Construction – Backfill Supplier (2005)
- Kemron Environmental Services – Analytical Laboratory
- Laboratory Data Consultants – Data Validation
- General Engineering Laboratories, LLC – Analytical Laboratory- Radiological Analysis
- Valley Forge Laboratory – Geotechnical Laboratory

- Materials Testing Group – Compaction Testing
- Langan Associates (Langan) – Surveying Contractor
- One Call Electric Service – Electrical Service Contractor
- Sonco Fence – Temporary Fence Supplier
- Johnny on the Spot – Portable Lavatory Supplier
- Master Locator – Utility Locator
- Sign-A-Rama – Signs
- Riccardi Tree Removal – Tree removal
- M&A Tree Service – Tree removal
- South Plainfield Police Department – Traffic control
- D&M A/C and Heating – Heating, ventilation, and air conditioning (HVAC) unit movement at 507 Hamilton Boulevard
- Kaiser Landscaping – Landscaping (2007)
- Pave-Rite – Asphalt replacement (2007)
- Mar-Ca Fence – Fence replacement (2007)
- Bob's Landscaping – Curb/Concrete walkways (2005)
- Verizon – Phone/DSL
- PSE&G – Electric
- Scientific Sales – Safety Supplies
- Laboratory Safety – Safety Supplies
- Airgas Safety – Safety Supplies
- Strategic Diagnostics – Immunoassay test kits
- Stefano Fence Systems – Fencing
- Maxxam Analytics – Air Monitoring
- Ashland Technologies – S&H equipment
- Pine Environmental – S&H equipment

- Associated Environmental – Small equipment
- Enterprise – Vehicle Rental
- Grainger – Supplies
- Home Depot – Supplies
- Noble Supply – Supplies
- Semcor – Supplies.

3.0 ACTIVITIES UNDERTAKEN TO IMPLEMENT THE REMEDIAL ACTION

To streamline the discussion of remedial actions conducted at OU1, the following sections are organized by project location within the OU. As previously stated, the remediation goals set forth in the ROD for each project area within OU1 are as follows:

- Reduce or eliminate the direct contact threat associated with contaminated soil and indoor dust to levels protective of current land use and considering the future residential use. Note that the actions described in this RACR only address PCB-contaminated soil. Interior dust contamination was previously addressed by another contractor

- Prevent exposure and minimize disturbance to the surrounding community of South Plainfield during implementation of the remedial action.

- The EPA is using 1 ppm as its Remediation Goal for this action. The state of New Jersey has developed a RDCSCC for PCBs of 0.49 ppm. Because this is not a promulgated standard, it is not an ARAR but rather a "To Be Considered" criterion. Because the New Jersey criterion is more conservative, it was considered when reviewing sample results.

3.1 [redacted]

[redacted], South Plainfield, New Jersey 07080, is a residential property located at Block 338, Lot 4. This property encompasses an area of approximately 7,500 square feet and is located in the vicinity of Arlington Avenue and Hamilton Boulevard (Figure 1.1-2).

3.1.1 Initial Assessment

Twenty samples were collected on this property during the RI, along with two duplicate samples (Figure 3.1-1). During the U.S. EPA Tier III sampling event, one sample (Location A1-002 with a Total PCB concentration of 2.9 milligrams per kilogram [mg/kg]) was previously collected from northwest of the driveway in the right of way (Appendix B). Aroclor-1254 or Aroclor-1260 was detected in the soils from 15 locations. Total PCB concentrations ranged up to 1.2 mg/kg and 44 mg/kg, respectively,

for the 0 to 2-inch below ground surface (bgs) and the 16- to 18-inch bgs intervals. Two samples, RS13-17 at 1.2 mg/kg and RS13-19 at 44 mg/kg, had Total PCB concentrations greater than 1 mg/kg, and as shown in Appendix B, both of these samples are located in the northeast portion (i.e., the rear) of the property, which is closest to the CDE site (FW, 2001).

3.1.2 Sampling

On November 9, 2005, CAPE collected an *in situ* waste characterization sample from within the planned excavation area. This sample was sent to Kemron for analysis for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP semivolatile organic compounds (SVOCs), TCLP Pesticides, TCLP Metals, PCBs, paint filter, reactivity, corrosivity, and ignitability. The analytical results (summarized in Table 3.0-1) indicated the material was non-hazardous and non-Toxic Substances Control Act (TSCA).

CAPE initially mobilized to the CDE site on November 14, 2005, and in accordance with the approved Work Plan, began delineating the excavation limits at each property using immunoassay field kits. In addition, confirmation soil samples were also submitted to Kemron for PCB analysis using EPA SW-846 Method 8082. However, due to improper sampling documentation, the soil samples collected during this mobilization were not considered usable.. Technical Memorandum 003 details CAPE's findings in regards to these samples and is included as Appendix G. As a result, confirmation samples were re-collected at later dates in 2006 and 2007.

The additional confirmation samples were collected during four sampling events ranging from July 2006 to March 2007. All samples were sent to Kemron for PCB analysis. To reduce analytical costs and delineate the excavations in accordance with the NJAC 7:26 sampling requirements, some samples were designated for immediate analysis and others were designated "extract and hold." The purpose of designating samples "extract and hold" was to reduce delays – if the initial samples exceeded the PCB action level, then the laboratory could immediately begin analyzing the "extract and hold" samples at USACE's and EPA's direction instead of experiencing downtime while CAPE collected additional samples.

Shallow surface samples were collected by hand, and deeper subsurface samples were collected by a subcontractor with direct-push drilling equipment. The samples were collected to meet sampling frequency requirements and to replace the unusable samples collected in November 2005.

Sampling events were conducted by CAPE on July 10, 2006, August 15-16, 2006, February 21, 2007, March 13, 2007, and March 29, 2007, from and an adjacent property, property, to delineate the excavation limits.

Results for the waste characterization samples are presented in Table 3.0-1, and PCB results for pre-excavation confirmation samples are presented in Table 3.1-1. Sampling locations and results are presented on Figure 3.1-1, and excavation limits and

confirmation sampling results are presented on Figure 3.1-2. Characterization samples were evaluated by a CAPE chemist, and pre-excavation confirmation samples were validated by either a CAPE chemist or a third-party validation firm. A data quality assessment report for the samples, as well as analytical laboratory reports and electronic data submittals, are included as Appendix H.

CAPE collected samples of potential backfill and topsoil material before having it imported to the site to verify that it was clean. Samples were sent to Kemron for analysis of Target Compound List (TCL) VOCs, TCL SVOCs, TCL Pesticides, PCBs, Herbicides, and Target Analyte List (TAL) Metals, and to General Engineering Laboratories (GEL) for analysis of Radium 226. Analytical data for these samples are provided in Table 3.0-2.

3.1.3 Excavation

CAPE initially mobilized to the property on November 14, 2005, and began site preparation activities and soil excavation. Preparation activities included installation of silt fence and project signs, removal of a hemlock tree (by Riccardi Tree Removal) that was within the excavation limits, and placement of polyethylene sheeting on the driveway and areas surrounding the excavation to protect them from spillage of excavated material. Excavation was accomplished with an excavator and was completed on November 17, 2005.

Excavated materials were loaded into 20-cubic yard (CY) roll-off containers. As stated previously, plastic sheeting was placed on the ground surface between the excavation and the containers to prevent any material spilled during the transfer into the containers from contacting the ground surface. Langan surveyed the limits of excavation for as-built purposes. 80.6 tons of non-hazardous, non-TSCA soil was transported off site for disposal during this mobilization.

Deviations from the planned work included removal of a 10- by 10-foot concrete patio area at the northwestern corner of the site without authorization. The 10' x 10' concrete pad was damaged/removed during the installation of sedimentation controls when a mini excavator was used in lieu of hand installation. In addition, a corner of the asphalt driveway was damaged from truck traffic, and a portion of the sod/yard was damaged near the patio, driveway, and sidewalk. The asphalt and sod were damaged by roll-off truck traffic due to the limited work space (i.e., loading/unloading area was slightly larger than the width of a roll off container).

As stated in Section 3.1.3, the pre-excavation confirmation samples that were collected in November 2005 were deemed unusable. These samples were planned for confirming the excavation of contaminated soils to PCB concentrations below the cleanup criteria. Because these samples were deemed unreliable, CAPE re-collected the samples in 2006 and 2007. The results of these samples indicated that the original excavation event in November 2005 did not remove all soil contaminated with PCBs above the cleanup criteria. Therefore, additional excavation was required and was performed in the spring of 2007.

CAPE personnel mobilized to the CDE sites in February 2007 to begin site preparation. The preparation activities at included removing the stockade fence and installing temporary fencing. On March 26, 2007, Langan returned to the 109 Arlington Avenue property and began staking the excavation limits. On March 28, CAPE contacted New Jersey One Call for utility clearance at the site.

In early April 2007, Langan returned to the site to continue marking the excavation limits and the neighboring property lines. CAPE met with the property owner on April 11 to discuss the plan for excavation and fencing removal. On April 12, 2007, CAPE obtained signed construction release forms from the property owners at , both of which neighbor the Avenue property. These release forms were necessary because three trees located at the corner of the three properties required removal for the excavation to proceed.

On April 13, 2007, M&A Tree Service cut down and removed the three trees at the corner of . A week later, CAPE excavated two of the tree stumps. The third stump, located just outside , was not removed due to its proximity to the shed located on the property. This stump was subsequently cut down below grade.

In mid-April, CAPE began preparing the excavation area and began removing necessary fencing. A Contaminant Reduction Zone (CRZ) and Exclusion Zone (EZ) were prepared, and plywood and geotextile fabric was placed on the ground to protect the grassed area from soils spillage. CAPE began the second round of excavation at Avenue on April 20, 2007, and completed excavation on April 23.

Photographs were taken of the pre-excavation conditions, excavation progress, and restoration and are included in Appendix I. Overall, approximately 1,390 square feet of property were excavated to a depth of 2 feet bgs. A total of about 103 CYs of non-hazardous, non-TSCA soil (or 191.5 tons) was transported off site for disposal. Figure 3.1-2 presents the extents of the excavation and the location of each confirmation sample remaining on the property. Confirmation sample locations conform to the NJDEP requirements of one sample per 900 square feet of bottom area, and one sample per 30 linear feet of excavation sidewall.

3.1.4 Backfill

Before importing and placing the backfill, CAPE collected samples of backfill material from each backfill source and verified that the material was clean. Analytical data for these samples showing the backfill material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

CAPE began backfilling at on November 17, 2005, using backfill material provided by TomKat Construction and topsoil provided by Country View. On November 18, 2005, CAPE was required to remove backfill that was saturated from water in the excavation and replaced it with new, dry backfill. CAPE placed and compacted the backfill material in lifts, and Materials Testing, Inc. (MT) performed compaction testing on the backfilled area. The requirement was for 85 percent

compaction for nonbearing areas and 95 percent compaction for structural areas. Compaction requirements were met.

After the second round of excavation was completed, CAPE began backfilling on April 24, 2007, with borrow material (silty sand) from a source in Tinton Falls, New Jersey. Backfill was provided by Maddox Materials. Backfill was placed to 6 inches below the finished grade and was graded with a bulldozer and compacted with a roller. Backfill material was placed in 1-foot lifts and compacted, and one compaction test was performed by MT per excavation area for each lift. Compaction requirements were met, and results are included in Appendix K. Each area was then restored to preconstruction conditions as described below.

3.1.5 Restoration

Before importing and placing the topsoil, CAPE collected samples of topsoil material and verified that the material was clean. Analytical data for these samples showing the topsoil material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

Six inches of topsoil provided by Country View were placed on top of the compacted and graded backfill. On November 28, 2005, CAPE saw-cut approximately 1 foot of the asphalt driveway adjacent to the backyard to inspect topsoil thickness and determined that topsoil thickness was in compliance. On April 26, 2007, CAPE began installation of the permanent fencing at the site, including installation of fence posts. Chain link fencing was installed along the rear of the property, and an 8-foot section of wooden stockade fencing was installed along the property line of
Avenue.

On October 12, 2006, Country View planted a weeping cherry tree at the site in a location designated by the property owner. The weeping cherry tree was planted to replace the hemlock tree that was removed in 2005 before excavation. Appendix G contains technical memorandum 001 that explains the justification for restoring the property with the weeping cherry tree in lieu of a hemlock tree. For the second round of excavation in April 2007, 6 inches of topsoil provided by Country View were placed over the compacted and graded backfill. Topsoil placement was completed on April 26 and was not compacted. Kaiser Landscaping placed sod in the disturbed areas of the yard and planted one pin oak tree, and CAPE seeded portions of the yard where needed.

CAPE saw-cut portions of the driveway that required repair. The property owner did not feel that the proposed plan to repair the driveway was sufficient to repair areas damaged by heavy equipment, so the property owner spoke to the EPA RPM. After this discussion with EPA, the property owner signed a Construction Release statement agreeing to a revised restoration plan, and per EPA and USACE direction, CAPE saw-cut additional portions of the driveway, including cracked and depressed areas, which increased the total asphalt repair area. On May 3, 2007, Pave Rite placed and compacted approximately 2 inches of asphalt at the rear end of the driveway. The as-built drawing in Appendix J shows how each disturbed area of the property was restored.

A signed Construction Release form was obtained on May 4, 2007.

3.2 [illegible]d

[illegible]rd, South Plainfield, New Jersey 07080, is a residential property located at Block 328, Lot 2. This property encompasses an area of approximately 15,000 square feet and is located in the vicinity of Spicer Avenue and Hamilton Boulevard (Figure 1.1-2).

3.2.1 Initial Assessment

Twenty samples (and one duplicate) were collected on this property during the RI (Figure 3.2-1). Aroclor-1254 was the only PCB compound present, and it was detected in 19 of the sample locations (Appendix C). Total PCB concentrations ranged from 0.065 mg/kg to 6.1 mg/kg (0 to 2 inches bgs) and from 0.014 mg/kg to 1.2 mg/kg (16 inches to 18 inches bgs). As shown in Appendix C, five samples (RS01-01 through RS01-05) located along Hamilton Boulevard had total PCB concentrations greater than 1 mg/kg (FW, 2001).

3.2.2 Sampling

On November 9, 2005, CAPE collected an *in situ* waste characterization sample from within the 408 Hamilton Boulevard planned excavation area. This sample was sent to Kemron for analysis for TCLP VOCs, TCLP SVOCs, TCLP Pesticides, TCLP Metals, PCBs, paint filter, reactivity, corrosivity, and ignitability. The analytical results (summarized in Table 3.0-1) indicated the material was non-hazardous and non-TSCA.

CAPE initially mobilized to the CDE site on November 14, 2005, and in accordance with the approved Work Plan, began delineating the excavation limits at each property using immunoassay field kits. In addition, confirmation soil samples were also submitted to Kemron for PCB analysis using EPA SW-846 Method 8082. However, due to improper sampling documentation, the soil samples collected during this mobilization were not considered usable. Technical Memorandum 003 details CAPE's findings in regards to these samples and is included as Appendix G. As a result, pre-excavation confirmation samples were re-collected at later dates in 2006 and 2007.

The additional confirmation samples were collected over a period ranging from July to October 2006. All samples were sent to Kemron for PCB analysis. To reduce analytical costs and delineate the excavations in accordance with the NJAC 7:26 sampling requirements, some samples were designated for immediate analysis and others were designated "extract and hold." The purpose of designating samples "extract and hold" was to reduce delays – if the initial samples exceeded the PCB action level, then the laboratory could immediately begin analyzing the "extract and hold" samples at USACE's and EPA's direction instead of experiencing downtime while CAPE collected additional samples.

Sampling events were conducted by CAPE on July 10, 2006, August 16, 2006, and October 11, 2006, from [illegible]l to delineate the excavation limits.

Shallow surface samples were collected by hand, and deeper subsurface samples were collected by a subcontractor with direct-push drilling equipment. The samples were collected to meet NJAC 7:26 sampling requirements.

Results for the waste characterization samples are presented in Table 3.0-1, and PCB results for pre-excavation confirmation samples are presented in Table 3.2-1. Sampling locations and results are presented on Figure 3.2-1, and excavation limits and confirmation sampling results are presented on Figure 3.2-2. Characterization samples were evaluated by a CAPE chemist, and pre-excavation confirmation samples were validated by either a CAPE chemist or a third-party validation firm. A data quality assessment report for the samples, as well as analytical laboratory reports and electronic data submittals, are included as Appendix H.

CAPE collected samples of potential backfill and topsoil material before having it imported to the site to verify that it was clean. Samples were sent to Kemron for analysis of TCL VOCs, TCL SVOCs, TCL Pesticides, PCBs, Herbicides, and TAL Metals, and to GEL for analysis of Radium 226. Analytical data for these samples are provided in Table 3.0-2.

3.2.3 Excavation

CAPE first mobilized to the ard property on November 21, 2005, to begin excavation along the curb and on the right and left side of the driveway. Excavation along the curb was completed the same day using a mini-excavator. CAPE also completed excavation within the main portion of the property on November 28-29, 2005. Excavation Areas A and B were completed in 2005. 201.98 tons of non-hazardous, non-TSCA soil was transported off site for disposal during this mobilization.

Based upon the confirmation sampling results obtained in July, August, and October 2006, CAPE returned to the site in early 2007 to perform additional excavation. Langan staked the excavation limits in March 2007, and New Jersey One Call was contacted for utility markings. Three additional areas (Areas C, D, and E) were excavated on April 5 and 6, 2007 (Figure 3.2-2), and Langan surveyed the excavation conditions. A small portion on the left side of the driveway was also excavated in 2007. Figure 3.2-2 presents the extents of each excavation area completed on the property and the location of each confirmation sample remaining on the property. Confirmation sample locations conform to the NJDEP requirements of one sample per 900 square feet of bottom area, and one sample per 30 linear feet of excavation sidewall. Excavation limits are also depicted on the as-built drawing in Appendix J.

Photographs were taken of the pre-excavation conditions, excavation progress, and restoration and are included in Appendix I. Approximately 2,060 square feet were excavated in Area A to a depth of 1.5 feet; 140 square feet were excavated in Area B to a depth of 2 feet; 520 square feet were excavated in Area C to a depth of 1.5 feet; 240 square feet were excavated in Area D to a depth of 2 feet; and 65 square feet were excavated in Area E to a depth of 3 feet. Overall, 179 CYs (or 295.56 tons) of non-hazardous, non-TSCA soil were transported off site for disposal.

3.2.4 Backfill

Before importing and placing the backfill, CAPE collected samples of backfill material from each backfill source and verified that the material was clean. Analytical data for these samples showing the backfill material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

CAPE began backfilling the excavated curb area with stone as the excavation progressed and completed backfill of the curb area on November 22, 2005, with dense graded aggregate (DGA) placed between the curb and the sidewalk. Backfill of the main property area was completed on November 30 using silty sand. Backfill material was compacted with a roller/compactor.

After CAPE mobilized for the second round of excavation in April 2007, each area was backfilled on the same day it was excavated. A silty sand backfill material provided by Maddox Materials was placed in each excavation area to 6 inches below the finished grade. Backfill material was placed in 1-foot lifts and compacted, and one compaction test was performed by MT per excavation area for each lift. Each area was then restored to preconstruction conditions as described below. Compaction results are included in Appendix K.

3.2.5 Restoration

Before importing and placing the topsoil, CAPE collected samples of topsoil material and verified that the material was clean. Analytical data for these samples showing the topsoil material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

Thirteen arborvitae shrubs were installed at the property on December 2, 2005, and CAPE replaced these on May 23, 2006, because they were dying. In Areas A, B, E, and part of Area D, which were previously grassy, 6 inches of topsoil was placed on top of the clean backfill, and then sod was laid. Topsoil was provided by Country View, and sod was provided by Kaiser Landscaping. In Area C and the remainder of Area D, a layer of geotextile fabric was placed on top of the clean backfill, and 6 inches of clean stone provided by Weldon Materials was placed on top of the fabric. Additional sod was placed on May 3, 2007, to fill in a bare spot. The as-built drawing in Appendix J shows how each disturbed area of the property was restored.

During the 2005 remedial action, sidewalk damage occurred at 408 and 507 Hamilton properties that required repair by CAPE. Appendix G, Technical Memorandum 002 summarizes the repairs implemented in 2005 to repair the damaged sidewalk sections.

On April 24 2007, CAPE met with the property owner in an attempt to get the owner to sign a Construction Release form. However, the property owner raised a couple of concerns. The property owner stated that a portion of the tree located near the street to the left of the driveway appeared to have died since the initial work began, and he requested that a small section of the area where CAPE placed sod have an additional strip of sod placed adjacent to it because the area was roughed up by heavy equipment. On

April 27, CAPE again met with the property owner and informed him that the tree in question would not be cut back as part of this project and that the grassed area where he requested additional sod was sparse before the soil excavation. On this date, the property owner requested to see photo or video documentation of these conditions before excavation.

The property owner's concerns were satisfactorily resolved, and a signed Construction Release form was obtained on May 8, 2007.

3.3 _____

, South Plainfield, New Jersey 07080, is a residential property located at Block 337, Lot 2. This property encompasses an area of approximately 10,000 square feet and is located in the vicinity of Spicer Avenue and Hamilton Boulevard (Figure 1.1-2).

3.3.1 Initial Assessment

Seventeen samples were collected on this property during the Tier I investigation (Figure 3.3-1). Total PCB concentrations ranged from a non-detectable concentration to 3.4 mg/kg at the 0 to 18-inch bgs interval (Appendix D). As shown in Appendix D, five samples located at the northern portion of the property along Hamilton Boulevard had Total PCB concentrations greater than 1 mg/kg, and one sample located in the southern corner of the property had a Total PCB concentration greater than 1 mg/kg (Weston, 1998 a and b).

3.3.2 Sampling

On November 9, 2005, CAPE collected an *in situ* waste characterization sample from within the planned excavation area. This sample was sent to Kemron for analysis for TCLP VOCs, TCLP SVOCs, TCLP Pesticides, TCLP Metals, PCBs, paint filter, reactivity, corrosivity, and ignitability. The analytical results (summarized in Table 3.0-1) indicated the material was non-hazardous and non-TSCA.

CAPE initially mobilized to the CDE site on November 14, 2005, and in accordance with the approved Work Plan, began delineating the excavation limits at each property using immunoassay field kits.

In addition, confirmation soil samples were also submitted to Kemron for PCB analysis using EPA SW-846 Method 8082. However, due to improper sampling documentation, the soil samples collected during this mobilization were not considered usable. Technical Memorandum 003 details CAPE's findings in regards to these samples and is included as Appendix G. As a result, pre-excavation confirmation samples were re-collected at later dates in 2006 and 2007.

The additional confirmation samples were collected over a period ranging from July to October 2006. All samples were sent to Kemron for PCB analysis. To reduce analytical costs and delineate the excavations in accordance with the NJAC 7:26 sampling

requirements, some samples were designated for immediate analysis and others were designated "extract and hold." The purpose of designating samples "extract and hold" was to reduce delays – if the initial samples exceeded the PCB action level, then the laboratory could immediately begin analyzing the "extract and hold" samples at USACE's and EPA's direction instead of experiencing downtime while CAPE collected additional samples.

Shallow surface samples were collected by hand, and deeper subsurface samples were collected by a subcontractor with direct-push drilling equipment. The samples were collected to meet NJAC 7:26 sampling requirements and to replace the unusable samples collected in November 2005.

Sampling events were conducted by CAPE on July 10, 2006, August 15, 2006, and October 11, 2006, from :o delineate the excavation limits.

Results for the waste characterization samples are presented in Table 3.0-1, and PCB results for pre-excavation confirmation samples are presented in Table 3.3-1. Sampling locations and results are presented on Figure 3.3-1, and excavation limits and confirmation sampling results are presented on Figure 3.3-2. Characterization samples were evaluated by a CAPE chemist, and pre-excavation confirmation samples were validated by either a CAPE chemist or a third-party validation firm. A data quality assessment report for the samples, as well as analytical laboratory reports and electronic data submittals, are included as Appendix H.

CAPE collected samples of potential backfill and topsoil material before having it imported to the site to verify that it was clean. Samples were sent to Kemron for analysis of TCL VOCs, TCL SVOCs, TCL Pesticides, PCBs, Herbicides, and TAL Metals, and to GEL for analysis of Radium 226. Analytical data for these samples are provided in Table 3.0-2.

3.3.3 Excavation

CAPE first mobilized to the property on November 19, 2005, to begin excavation in the yard with a mini-excavator, which was completed the following day. CAPE excavated the yard on the left and right side of the property, as well as the area to the right of the garage. Langan surveyed the excavated areas for as-built purposes. In addition to excavating, CAPE removed one live pine tree and one dead pine tree along the right side of the driveway to gain access to the excavation area along the right side of the garage. Removal of these two trees was authorized by USACE. 211.82 tons of non-hazardous, non-TSCA soil was transported off site for disposal during this mobilization.

Based upon the sampling results obtained in July, August, and October 2006, CAPE returned to the site in early 2007 to complete excavation. Langan staked the new excavation limits in March 2007, and CAPE contacted New Jersey One Call on March 28, 2007, for utility locations. In early April 2007, CAPE cut the asphalt that was within the limits of excavation to prepare for the excavation. D&M A/C & Heating disconnected and moved the HVAC unit and placed temporary heating units inside the

day care section of the building. CAPE loosened the chain link fence fabric and moved the playground toys and materials out of the way of excavation activities. Plastic sheeting was placed over the playground equipment and toys, and CAPE began excavation on April 7, 2007.

CAPE placed plywood and plastic sheeting over the ground surface to protect the asphalt and grassed areas as needed from spillage of excavated soils. The Belgium block border and fencing were removed from Area F. Excavation of Areas A, D, E, and F was accomplished with a mini-excavator and was completed on April 10, 2007. In addition to excavating these areas within the property, CAPE also performed some over-excavation along the property lines that adjoin with the Avenue properties. These three properties were remediated in the past up to the fence line that borders , but to ensure that all contamination was removed, CAPE excavated up to 2 feet beyond the property lines, to depths up to 2 feet bgs.

Langan surveyed the excavations for as-built purposes. On April 26, 2007, CAPE received a Construction Release form signed by the property owner.

Photographs were taken of the pre-excavation conditions, excavation progress, and restoration and are included in Appendix I. Approximately 1,210 square feet were excavated to a depth of 2 feet in Area A; 175 square feet were excavated to a depth of 1 foot in Area B; 400 square feet were excavated to a depth of 2 feet in Area C; 115 square feet were excavated to a depth of 1.5 feet in Area D; 450 square feet were excavated to a depth of 1 foot in Area E; and 850 square feet were excavated to a depth of 1.5 feet in Area F. Overall, 197 CYs (or 335.43 tons) of non-hazardous, non-TSCA soil were transported off site for disposal.

Figure 3.3-2 presents the extents of each excavation area completed on the property, and the location of each confirmation sample remaining on the property. Confirmation sample locations conform to the NJDEP requirements of one sample per 900 square feet of bottom area, and one sample per 30 linear feet of excavation sidewall. Excavation limits are also depicted on the as-built drawing in Appendix J.

3.3.4 Backfill

Before importing and placing the backfill, CAPE collected samples of backfill material from each backfill source and verified that the material was clean. Analytical data for these samples showing the backfill material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

CAPE began backfilling in November 2005 immediately after excavation in an area was complete. A sandy backfill material was used and was compacted and tested by MT. The requirement was for 85 percent compaction for nonbearing areas and 95 percent compaction for structural areas. Compaction requirements were met.

After the second round of excavation was completed, CAPE immediately began backfilling on April 7, 2007, with borrow material (silty sand) from a source in Tinton

Falls, New Jersey. Backfill was provided by Maddox Materials, placed to 6 inches below the finished grade, graded with a bulldozer, and compacted with a roller. Backfill material was placed in 1-foot lifts and compacted, and one compaction test was performed by MT per excavation area for each lift. Compaction requirements were met, and results are included in Appendix K. Each area was then restored to preconstruction conditions as described below.

3.3.5 Restoration

Before importing and placing the topsoil, CAPE collected samples of topsoil material and verified that the material was clean. Analytical data for these samples showing the topsoil material was clean in accordance with the New Jersey RDCSCC levels are provided in Table 3.0-2.

Gravel was placed along the right side of the garage on November 20, 2005, after the first round of excavation and backfill was complete, and a 6-inch layer of topsoil was placed over the compacted, graded backfill in the yard on the right side of the property. On November 28, 2005, CAPE and USACE evaluated topsoil thickness and determined that additional topsoil was needed and that some backfill in front of the steps should be removed to maintain the original grade. CAPE removed approximately 1 inch to 2 inches of backfill that was placed in front of the steps and placed additional topsoil to achieve the desired 6-inch topsoil thickness.

CAPE purchased and installed two rose bushes and one lilac bush on July 10, 2006, in locations desired by the property owner.

For the second round of excavation, after the upper, final lift of backfill was sufficiently compacted and graded, CAPE placed and compacted a 6-inch layer of DGA in Area F (driveway) in preparation of asphalt installation, placed a 4-inch layer of 0.75-inch clean stone in Area D, and placed topsoil in Areas A and E. DGA was placed adjacent to the playground area per direction by USACE, and the playground equipment and toys were returned to their original location. Additional rubber mulch was added to the playground area. Langan surveyed the restored conditions for as-built purposes.
During the 2005 remedial action, sidewalk damage occurred at
properties that required repair by CAPE. Appendix G, Technical Memorandum 002 summarizes the repairs implemented in 2005 to repair the damaged sidewalk sections.

In April 2007, CAPE formed and poured the concrete pad for the HVAC unit and repaired the damage to the concrete walkway. D&M A/C & Heating reinstalled the HVAC unit on April 17, 2007, and removed the temporary heating equipment.

From April 13-19, 2007, CAPE replaced the Belgium block driveway curbing. The fencing fabric around the HVAC unit was reinstalled, and geotextile fabric and 0.75-inch clean stone was placed in the vicinity of the HVAC unit. Kaiser Landscaping placed sod along the property lines of : as well
as !. Mar-Ca Fence installed a new
chain link fence along d property line, which was secured to

the existing wooden fence. A new section of 4-foot picket fencing was installed at the rear of the garage on the right side, and a landscaping tie was installed at the HVAC unit.

Toward the end of April 2007, Pave Rite saw-cut, removed, loaded out, and recycled asphalt from the right side of the driveway. New asphalt was placed in the driveway to meet up with the existing asphalt. CAPE cleaned the Belgium block driveway curbing of grout and asphalt. The as-built drawing included in Appendix J shows how each disturbed area of the property was restored.

A signed Construction Release form was obtained from the property owner on April 26, 2007.

3.4 [redacted]

[redacted], South Plainfield, New Jersey 07080, is a residential property located at Block 334, Lots 1 and 2. This property encompasses an area of approximately 8,600 square feet and is located in the vicinity of Spicer Avenue and Factory Street (Figure 1.1-2).

3.4.1 Initial Assessment

With the exception of Location RS18-05, located in the center of the rear portion of the property (Figure 3.4-1), all of the samples collected at this property contained detectable levels of Aroclor-1254 (Appendix E). In the shallow 0 to 2-inch bgs interval, Total PCB concentrations ranged from 0.077 mg/kg to 57 mg/kg. As shown in Appendix E, nine samples had Total PCB concentrations greater than 1 mg/kg. These locations were present in the north, northwest, and west along the property boundaries, with the maximum concentration (310 mg/kg) located in the northern corner of the property at a depth of 16- to 18- inch bgs. This property is located adjacent to the former CDE facility.

3.4.2 Sampling

CAPE collected confirmation soil samples and waste characterization samples in January 2006. The pre-excavation confirmation samples were submitted to Kemron for PCB analysis using EPA SW-846 Method 8082, and the characterization samples were submitted to Kemron for analysis of TCLP VOCs, TCLP SVOCs, TCLP Pesticides, TCLP Herbicides, TCLP Metals, PCBs, corrosivity, ignitability, reactivity, paint filter, chemical oxygen demand, ammonia nitrogen, n-hexane extractable material, total volatile solids, and total petroleum hydrocarbons. Due to improper sampling documentation, these pre-excavation confirmation samples and waste characterization samples were considered unusable and their results will not be discussed in this report. It should be noted that one of the samples (321S-SO-HAZ) collected in January 2006 was from an area that was suspected to be heavily contaminated, which is substantiated by the analytical results. This sample was analyzed for typical waste characterization parameters. During preparation for excavation, this area was identified as being outside the project excavation limits for the [redacted] y. CAPE did not excavate this area during this remedial action.

CAPE re-collected two waste characterization samples on October 12, 2006. A 30- by 30-foot grid was placed over the property, and two composite samples were collected from separate locations based on the grid. The samples were sent to Kemron for analysis of TCLP VOCs, TCLP SVOCs, TCLP Pesticides, TCLP Herbicides, TCLP Metals, PCBs, corrosivity, ignitability, reactivity, and paint filter. The results indicated the soils were non-hazardous and non-TSCA.

The pre-excavation confirmation samples used to determine the limits of excavation in accordance with NJAC 7:26 sampling requirements were re-collected over a period ranging from July 2006 to March 2007. All samples were sent to Kemron for PCB analysis. To reduce analytical costs and delineate the excavations in accordance with the NJAC 7:26 sampling requirements, some samples were designated for immediate analysis and others were designated "extract and hold." The purpose of designating samples "extract and hold" was to reduce delays – if the initial samples exceeded the PCB action level, then the laboratory could immediately begin analyzing the "extract and hold" samples at USACE's and EPA's direction instead of experiencing downtime while CAPE collected additional samples.

Shallow surface samples were collected by hand, and deeper subsurface samples were collected by a subcontractor with direct-push drilling equipment. The samples were collected to meet NJAC 7:26 sampling requirements and to replace the unusable samples collected in January 2006.

Sampling events were conducted by CAPE on July 12 and 13, 2006, August 15, 2006, October 11 and 12, 2006, and March 14, 2007, from to delineate the excavation limits.

On October 24, 2006, CAPE cored through the concrete pad and collected seven concrete core samples for PCB analysis. The cores that were collected were varying thicknesses, ranging from 2 inches to 5.5 inches thick. CAPE attempted to core through the entire depth of the concrete pad, but in most instances, the core broke before that point. Core holes were filled with sand upon completion. The purpose of the coring was to determine the concrete pad thickness, as well as to characterize the concrete for disposal purposes. The concrete pad was within the area of excavation (located behind the shed) and was later broken up and disposed off site.

CAPE collected samples of potential backfill and topsoil material before having it imported to the site to verify that it was clean. Samples were sent to Kemron for analysis of TCL VOCs, TCL SVOCs, TCL Pesticides, PCBs, Herbicides, and TAL Metals, and to GEL for analysis of Radium 226. Analytical data for these samples are provided in Table 3.0-2.

Results for the waste characterization samples are presented in Table 3.0-1, and PCB results for pre-excavation confirmation samples are presented in Table 3.4-1. Sampling locations and results are presented on Figure 3.4-1, and excavation limits and confirmation sampling results are presented on Figure 3.4-2. Characterization samples were evaluated by a CAPE chemist, and pre-excavation confirmation samples were validated by either a CAPE chemist or a third-party validation firm. A data quality

assessment report for the samples, as well as analytical laboratory reports and electronic data submittals, are included as Appendix H.

3.4.3 Excavation

CAPE began preparing the property for excavation on March 24, 2007, when a subcontractor removed a tree from the New Jersey property. Langan staked the excavation limits, and New Jersey One Call was contacted for utility locations. CAPE stabilized the area on Factory Street adjacent to the subject property by creating a construction entrance with DGA and 2- to 3-inch stone. Limited clearing and grubbing was conducted, and woody debris was chipped on site, silt fence and high-visibility safety fence was installed, and the tenant's materials and equipment were relocated. As an added means of sedimentation prevention, inlet filters were installed on two catch basins located near the property. A temporary chain link fence was installed and a wooden deck was removed. On April 4, 2007, CAPE began demolition of the concrete pads and walkways on the property. Before demolition of the concrete pad, the tenant requested that clean stone be placed on his property during restoration in lieu of replacing the concrete pad.

CAPE began excavation at on April 5, 2007, in Area D (Figure 3.4-2). Excavation was performed with heavy equipment and included hand digging in areas of utilities. While excavating, a 2-inch pipe was uncovered that extended from the southeast face of the basement crawl space. A coupling was placed on the end of the pipe and it was extended above grade. A second pipe was unearthed and appeared to be an abandoned sewer pipe or a French drain. This pipe ran along the front of the building and south toward the creek for approximately 15 feet. The pipe was full of soil and was not connected at either end. Several other pipes ranging from 1 inch to 4 inches in diameter were encountered exiting the house basement. These were cut at the building foundation and extended above ground. An electrical conduit running from the house to the shed was uncovered and was left connected.

CAPE continued excavating Area D and began excavating Areas C and E (Figure 3.4-2), which also included limited hand digging. As the excavation progressed, CAPE continued demolition of the concrete walkway and pad, and Langan recorded excavation limits for as-built purposes. While excavating in Area E (which was approximately 5 feet deep), water began entering the excavation from the water table. On April 13, 2007, CAPE began excavating Area B (Figure 3.4-2), which included hand digging in areas of utilities and the building foundation. A severe rain event caused flooding on April 16, and work was delayed until April 24. Excavation of Area B was completed, and excavation of Area F (Figure 3.4-2) began on April 24. CAPE hand dug around the foundation in Area F and around the water line that was encountered running parallel to Spicer Avenue, approximately 6 feet offset from the road at a depth of about 3 feet bgs. Excavation of Area F was completed on April 25, and excavation in Area A began. On April 26, 2007, excavation at was completed.

Photographs were taken of the pre-excavation conditions, excavation progress, and restoration and are included in Appendix I. Approximately 2,100 square feet were excavated to a depth of 2 feet in Area A; 1,370 square feet were excavated to a depth of 3

feet in Area B; 1,875 square feet were excavated to a depth of 4 feet in Area C; 1,760 square feet were excavated to a depth of 2 feet in Area D; 710 square feet were excavated to a depth of 5 feet in Area E; and 500 square feet were excavated to a depth of 3 feet in Area F. Overall, 902 CYs (or 1,504.33 tons) of non-hazardous, non-TSCA soil were transported off site for disposal.

Figure 3.4-2 presents the extents of each excavation area completed on the property, and the location of each confirmation sample remaining on the property. Confirmation sample locations conform to the NJDEP requirements of one sample per 900 square feet of bottom area, and one sample per 30 linear feet of excavation sidewall. Excavation limits are also depicted on the as-built drawing in Appendix J.

3.4.4 Backfill

CAPE began backfilling the property as excavation proceeded. Backfill consisted of a silty sand material from a source in Tinton Falls, New Jersey, that was provided by Maddox Materials. Backfill was placed to 6 inches below the finished grade, graded with a bulldozer, and compacted with a roller. CAPE collected samples of the clean backfill material before having it imported to the site. Samples were sent to Kemron for analysis of TCL VOCs, TCL SVOCs, TCL Pesticides, PCBs, Herbicides, and TAL Metals, and to GEL for analysis of Radium 226. Analytical data for these samples showing the backfill material was clean in accordance with the New Jersey Clean Fill requirements are provided in Table 3.0-2. Backfill material was placed in 1-foot lifts and compacted, and one compaction test was performed by MT per excavation area for each lift, on both areas filled with borrow material and areas filled with DGA. Compaction requirements were 85 percent for nonbearing areas and 95 percent for structural areas; requirements were met in all areas. Compaction results are included in Appendix K.

Before placing fill material in the excavations, CAPE lined the edges of the excavations with a geotextile to identify the limits of excavation for future soil removal along Factory Street. Backfill placement was completed on April 26, 2007, though grading of borrow material, DGA, and 0.75-inch stone continued after that. Due to flooding within the excavation limits at the property, on April 27, CAPE collected one sample (BF-042707) from placed borrow soil in the rear of the house and analyzed the sample for PCBs at USACE's direction. The sample result was non-detect for PCBs, which is presented on Table 3.0-2. After backfilling, compaction, and grading was complete, each area was then restored to preconstruction conditions as described below.

3.4.5 Restoration

On April 4, 2007, CAPE spread grass seed over the area of the site that was disturbed during construction of the tenant's materials storage area and truck turnaround area. CAPE began forming the front walkway and pad near the backyard shed on April 30, and MT performed compaction testing on the base material of the walkway. The base material met the 95 percent structural compaction requirement. On May 1, 2007, CAPE poured and finished the walkways and pad using 4,000-pounds per square inch (psi) concrete. MT measured the concrete's slump and temperature and collected four

concrete cylinders for compressive strength tests. The compressive strength results were 3,134 psi at 7 days and 4,199 and 4,227 psi at 28 days. Compaction and concrete results are included in Appendix K.

A small Belgium block curb between the house and the walkway was constructed and grouted, and the chain link fencing was reattached. CAPE relocated the Barbato Company sign, removed temporary fencing, and prepared for permanent fence installation. Mar-Ca installed wooden and galvanized steel fence posts where required and completed installation of the chain link fence and gates on May 18. On May 3, 2007, Pave Rite placed and compacted approximately 2 inches of base material and 2 inches of asphalt in the parking lot west of the house. Topsoil placement was completed on May 4. The tenant's materials and equipment were moved back onto his property on May 7. CAPE placed grass seed where needed on the neighboring township property, and Kaiser landscaping planted shrubs, mulched, and placed sod on the property. Other restoration activities included repair of the damaged stone step in the rear of the house, placement of downspouts around the house, and placement of 0.75-inch stone at Factory Street. Restoration details for the property are depicted on the as-built drawing included in Appendix J.

A signed Construction Release form was obtained from the tenant on May 24, 2007.

3.5 Transportation And Disposal Summary

CAPE contracted with WTDI, who in turn contracted with Freehold Cartage, to handle transportation and Waste Management to handle disposal of all non-hazardous, non-TSCA soil and debris generated during the 2005 work. From December 20-23, 2005, CAPE's CQCSM oversaw the transport of non-hazardous, non-TSCA soil from storage at the Freehold Cartage yard to the G.R.O.W.S. Landfill operated by Waste Management.

Waste Solutions Group (WSG) handled both the transportation and disposal (T&D) of all non-hazardous, non-TSCA soil and debris from the project during the 2007 work. WSG's T&D Coordinator managed trucks and drivers by coordinating drop off and pick up of empty and full containers, as well as coordination of trucks at the specific properties.

Waste profiles were completed for each work event using information known about the waste and the waste characterization sampling results. Before CAPE transported any waste off site, an EPA Off-Site Rule form was completed for the waste transporter and disposal facility and was submitted to the EPA RPM for approval by EPA's offsite coordinator. Before any waste was transported off site, the drivers' license, proof of insurance, and registration were checked. Table 3.5-1 presents the waste tracking log for each shipment manifested off site. Appendix L includes (T&D) documentation for the project, including waste profiles, bills of lading, manifests, and certificate of disposal. The following table summarizes the quantity and disposal facility for each property.

Source	Media	Quantity	Disposal Facility
	Non-hazardous/Non-TSCA Soil & Debris	80.6 Tons	GROWS Landfill, Pennsylvania
	Non-hazardous/Non-TSCA Soil & Debris	110.90 Tons	Ottawa County Landfill, Ohio
	Non-hazardous/Non-TSCA Soil & Debris	201.98 Tons	GROWS Landfill, Pennsylvania
	Non-hazardous/Non-TSCA Soil & Debris	93.58 Tons	Ottawa County Landfill, Ohio
	Non-hazardous/Non-TSCA Soil & Debris	211.82 Tons	GROWS Landfill, Pennsylvania
	Non-hazardous/Non-TSCA Soil & Debris	123.61 Tons	Ottawa County Landfill, Ohio
	Non-hazardous/Non-TSCA Soil & Debris	1,504.33 Tons	Ottawa County Landfill, Ohio

3.6 Property Restoration

CAPE collected several samples of topsoil and backfill material in February and March 2007. Three topsoil samples were collected: one from a Country View source in Ewing, New Jersey; one from a Country View source in Monroe, New Jersey; and one from a Maddox Materials source in Cranbury, New Jersey. The analytical results of these samples are summarized in Table 3.0-2. However, none of these topsoil sources were used. The Country View source in Ewing had a beryllium concentration above the New Jersey RDCSCC level; the Country View source in Monroe had a pH higher than 7; and the Maddox Materials source in Cranbury contained greater than 5 percent deleterious materials. CAPE submitted historical analytical data from a Country View source in Somerset, New Jersey that was used on a previous CAPE/USACE/EPA project and this source was deemed acceptable and was used. The results of this sample (BIP-SO-TS01) are also included on Table 3.0-2.

Several backfill samples were collected in November 2005 and February 2007. In 2005, backfill samples were collected for general fill from TomKat construction's location (Lots 11 and 13, Block 28), Millstone, New Jersey, and Country View's topsoil stockpiled located on Washington Valley Road, (Lots 19, 20.01, 20.03, 22.01, & 22.02, Block 70) Warren Township, NJ. Samples were submitted to Valley Forge Labs in Valley Forge, Pennsylvania, for geotechnical analysis (grain size and standard proctor), to Kemron for chemical analysis (TCL VOCs, TCL SVOCS, TCL Pesticides, Herbicides, PCBs, and TAL Metals), and to GEL for radium analysis. The results of the backfill and topsoil met New Jersey RDCSCC criteria.

Samples were collected in February 2007 from a Maddox Materials borrow pit located at 3230 Shafto Road (Lot 4.02, Block 144), Tinton Falls, Monmouth County, New Jersey. Four samples were collected to meet the sampling frequency requirement of one sample per 250 CY of backfill material used on site. These samples were submitted to Valley Forge Labs in Valley Forge, Pennsylvania, for geotechnical analysis (grain size and standard proctor), to Kemron for chemical analysis (TCL VOCs, TCL SVOCS, TCL Pesticides, Herbicides, PCBs, and TAL Metals), and to GEL for radium analysis. The

results of the Maddox Materials backfill met New Jersey RDCSCC criteria and are summarized in Table 3.0-2.

Upon completion of all remediation activities, each property was restored to its original condition. Trees, shrubs, and sod that were placed at the four properties have a 1-year warranty from the date they were planted. A planting and sod care plan was provided to each property owner. Punchlist items that were noted during the pre-final inspection were corrected beginning on May 9, 2007. The laydown/staging area was graded, and the excess, large, 2- to 3-inch stone that CAPE had placed on the ground was removed and replaced with 0.75-inch stone. Trash was removed from the site before demobilization, and government property was transferred to the government on May 9, 2007.

3.7 Demobilization

CAPE began demobilization on May 7, 2007, by removing project signage and the site trailer. The union crew demobilized on May 9, 2007. Before demobilization, heavy equipment underwent gross decontamination and was returned to its vendor. Portable sanitary facilities were removed from the jobsite, and government property was transferred to the government. CAPE's belongings and files were removed from the site trailer, and CAPE's tools and equipment were removed from the site. CAPE's landscaping subcontractor (Kaiser Landscaping) returned to the properties periodically to water the trees, shrubs, and sod.

4.0 CHRONOLOGY OF EVENTS

Table 4.0-1 provides a summary of the major events for OU1 at the CDE Superfund site . As required, the table includes all significant milestones and dates. The final schedule for the project is included as Appendix M.

5.0 SUMMARY OF QUALITY ASSURANCE AND QUALITY CONTROL

CAPE was responsible for the development, implementation, and management of the Contractor Quality Control Plan (CQCP). All subcontractor personnel adhered to the requirements of the plan through their respective quality organizations.

5.1 Organization, Personnel, And Responsibilities

The CAPE Project Manager (PM) communicated the content and intentions of the contract documents to all members of the project team to ensure consistency of project understanding and planned implementation. Coordination was based upon the three-phase QC process (preparatory, initial, and follow-up).

The following list includes personnel who were involved in the QA/QC process for the project:

- QA Director – Chris Caviness
- PM –David Bettendorf and Michael Lamon
- Site Superintendent – Jerry Hackworth and Charlie McNeil
- CQCSM – Chuck Reed, William Torres, and Robert Landle
- SSHO – Ken Beatty and Glen Mayekawa
- Corporate Health and Safety Manager (CHSM) – Glen Mayekawa.

The CQCSM was the focal point of QC efforts on this project. He reported to the PM for project execution and he coordinated closely with the PM and Site Superintendent to maintain independence for all quality issues. The CQCSM worked closely with the Site Superintendent to communicate the project QC system requirements to all CAPE staff, subcontractors, and vendors, and to ensure the QC system was implemented properly and that consistent quality results were achieved.

The CAPE QC organization clearly identifies the authority and responsibility for all QA/QC aspects. Each project team member with CQC duties, responsibilities, and authority had specific job descriptions, as outlined in the CQCP.

5.2 Preconstruction Submittals

Various submittals were required by the USACE contracting office and the contract documents before the beginning of, and through the completion of, the construction activities. These submittals are outlined in a submittal register. Every submittal was accompanied by a *Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance (ENG Form 4025)*. Submittals were prepared and reviewed by CAPE's CQCSM and submitted to the USACE Project Engineer. USACE's Project Engineer and Contracting Officer's Representative reviewed the submittals and either acknowledged receipt, accepted, or rejected the submittals.

5.3 Daily Quality Control Reports

A Daily Quality Control Report (DQCR) documenting project activities was completed for each day of fieldwork using the USACE Quality Control System/Resident Management System software. Reports covered both conforming and nonconforming work and, where applicable, included a statement of certification that all materials, supplies, and work accepted that day complied with the contract requirements. DQCRs were signed by the CQCSM to validate the certification, initialed by the Superintendent, and were submitted to the USACE Project Engineer. Copies of the DQCRs are included in Appendix N, Daily Quality Control Reports.

The DQCRs included the following information:

- Description of work performed
- Number of personnel working on the project by company and trade and hours worked
- Number of hours each piece of heavy equipment was used

- Results of inspections and tests
- Samples collected
- Types of defects/causes for rejection, if any
- Corrective actions proposed/taken, if any
- Weather conditions
- Delays and their causes, if any
- Verbal instructions received
- S&H activities.

5.4 Testing

Throughout the course of work, the CQCSM was responsible for reviewing all testing and inspection requirements for each activity or phase of work. The CQCSM observed or conducted field tests to verify the materials and fieldwork were in compliance with the project specifications. Tests included proctors and sieve analyses on the backfill materials, compaction tests on the backfill material and the asphalt subgrade material, and concrete tests on delivered concrete. The aforementioned tests were performed by a subcontractor, and test results are included in Appendix K, Materials Testing Reports.

5.5 Meetings And Inspections

A Preconstruction Meeting was held on March 15, 2007, with the USACE, EPA, and CAPE to discuss the project goals and timeline and to review the project contract. Thereafter, progress meetings were typically conducted weekly. Meeting minutes were prepared by CAPE and distributed to participants after each meeting.

Every team member conducted inspections throughout the course of the project. Heavy equipment was thoroughly inspected upon arrival at the job site to verify that the equipment was operable and in a good, safe condition. Heavy equipment and tools were inspected daily for wear and general condition to ensure the safety of the operators and the personnel around them. Daily inspections of the work areas were made to ensure the safety of those operating in and around the site.

The CQCSM was responsible for reviewing all inspection requirements for each activity or DFW. The CQCSM performed daily field inspections to verify the materials and fieldwork were in compliance with the project specifications. The excavations and backfill elevations were periodically checked by CAPE's grade foreman to ensure the excavation was to the correct depth and limits and to ensure the backfill was placed to match the original grade of the area. The topsoil thickness was routinely checked by CAPE laborers to ensure minimum thickness requirements were being met. The excavation depths and limits and the backfill final grade were also surveyed by a licensed

surveyor. Preparatory and initial inspections were held for each DFW, and follow-up inspections were performed daily for ongoing DFWs.

A representative from the Freehold Soil Conservation District performed a site inspection on April 3, 2007, to inspect the sites and the erosion and sedimentation controls. No issues or concerns were noted.

A pre-final walkthrough inspection was conducted on May 8, 2007, with CAPE, EPA, and USACE at all four properties. The purpose of the inspection was to develop a punchlist of outstanding work items so that CAPE could address the issues before demobilization and the final inspection. There were no major outstanding tasks, and the items on the punchlist primarily involved site cleanup and restoration. Details of this inspection are presented in Section 7.0.

A final inspection at CAPE's laydown area occurred on May 10, 2007. Representatives from CAPE, EPA, and the Borough of South Plainfield Department of Public Works were present for the inspection. No issues or concerns were noted.

A final walkthrough inspection of all four properties occurred on May 24, 2007. Representatives from CAPE, EPA, and USACE were present for the inspection. No issues or concerns were noted.

6.0 SUMMARY OF HEALTH AND SAFETY PROCEDURES

6.1 Introduction

CAPE was responsible for the development, implementation, and management of the Health and Safety Program for this project. The program involved developing and implementing a SSHP designed to identify and evaluate S&H hazards at the worksite, prescribe safety monitoring and control measures, and ensure all site personnel had the proper training. The SSHP served as the primary S&H guidance for CAPE operations necessary to perform the work at the site. All subcontractor personnel adhered to the requirements of the plan through their respective safety organizations.

This section summarizes the performance activities of the S&H program conducted under the project SSHP. The CDE Superfund site project included excavation and backfill; surveying by a subcontractor; sampling; transportation and offsite disposal of contaminated soils/sediments and debris; site restoration, including asphalt placement and fence construction by subcontractors; and demobilization activities. The project activities took place over a period of 1.5 years (November 2005 to May 2007). CAPE used the SSHP as guidance during the execution of the onsite activities.

The section is organized to present:

- Organization, personnel, and responsibilities
- Identified health and safety hazards
- PPE requirements

- Health and safety summary
  - S&H performance
  - Final decontamination
  - Exposure monitoring summary
  - Standard safety procedures
  - Training.

6.2 Organization, Personnel, and Responsibilities

The SSHP provides information on project personnel and a description of CAPE personnel S&H responsibilities.

Key project personnel and their functions were:

- SSHO – Ken Beatty and Glen Mayekawa
- CHSM – Glen Mayekawa
- PM –David Bettendorf and Michael Lamon
- Site Superintendent – Jerry Hackworth and Charlie McNeil.

Specific responsibilities for the project team were outlined in the SSHP.

6.3 Identified Health and Safety Hazards

The main objective of this project was to remove contaminated soils from four residential properties. Activity hazards were analyzed for each work task performed, and task-specific hazards were identified before the initiation of work. For S&H purposes, project fieldwork was organized into the following primary work tasks:

- Mobilization and Site Preparation
- Sampling
- Remediation
- Site Restoration and Demobilization.

Site hazards and hazard control measures for chemical, physical, and biological hazards that were likely to be encountered during the project were reviewed in the Site Hazards section of the SSHP. Some of the main physical hazards encountered were heavy equipment operation, excavation, underground and overhead utilities, vehicle and equipment traffic control, material handling, chain saw operation, tree removal operation, and inclement weather and adverse environmental conditions. The contaminant of concern encountered during project fieldwork was PCB.

6.4 Personal Protective Equipment Requirements

PPE was required for all construction activities. Certain field operations required additional PPE, based on the potential for contaminant exposure. The SSHO and Safety and Health Manager (SHM) established appropriate levels of protection for each work activity based on review of historical site information, existing contaminant data, and

evaluation of the potential for exposure. Two levels of PPE were required for the project and are listed below:

Level D Protection: Level D protection was used when there was no significant potential for contaminant exposure and consisted of:

- Coveralls or standard work clothing
- Steel-toed leather work boots
- Hard hat
- Safety glasses
- Goggles (if liquid splash hazard)
- Face shield (polycarbonate for pressure washing)
- Gloves (when handling material)
- Ear plugs (when noise levels exceeded 85 decibels on the A-weighted scale [dBA])
- High-visibility safety vest with reflective striping.

Level D protection was used for the following activities:

- Mobilization and site preparation
- Excavation
- T&D of contaminated soils
- Backfilling, compaction, and site restoration work
- Demobilization.

Modified Level D Protection: Modified Level D protection was worn when some skin protection was desired for protection against accidental skin contact with contaminants and consisted of:

- Disposable coveralls
- Steel-toed leather work boots with optional boot covers or PVC steel-toed work boots
- Gloves, inner, chemical-resistant (nitrile) and outer gloves, chemical-resistant (nitrile for dexterity; PVC or neoprene for heavy work)
- Chain saw chaps, ear muffs, and full-face shield
- Welding hood
- Hard hat
- Safety glasses
- Goggles (if liquid splash hazard)
- Face shield (polycarbonate for pressure washing)
- Ear plugs (when noise levels exceeded 85 dBA)
- High-visibility safety vest with reflective striping.

Modified Level D protection was used for the following activities:

- Sampling activities
- Equipment decontamination
- Clearing and grubbing and any other activities that involved use of power saws.

6.5 Health and Safety Summary

This section is organized to present:

- A summary of overall performance of S&H on the project (i.e., accidents or incidents, including near misses, unusual events, lessons learned)
- A description of final decontamination procedures and techniques used to decontaminate equipment and vehicles
- A summary of exposure monitoring and air sampling accomplished during the project
- A summary of standard safety procedures and S&H training.

6.5.1 Safety and Health Performance

Toolbox safety meetings were conducted daily at the start of each workday. Overall, safety performance was good throughout the duration of the project. There were five S&H and property damage incidents documented during the fieldwork:

- A 10- by 10-foot concrete patio was removed from the northwestern corner of the 109 Arlington Avenue property without authorization
- A corner of the 109 Arlington Avenue asphalt driveway was damaged from truck traffic
- While removing broken concrete pieces adjacent to the rear steps at 321 Spicer Avenue, the equipment operator caused damage to the rear steps when the excavator bucket came in contact with the steps, resulting in chipping/cracking of one of the slate steps
- The excavator operator did not fully close the bucket before retracting the arm of the excavator, which resulted in the bucket contacting the top right corner of the excavator cab and causing damage
- The concrete walkway at the rear of the house at 507 Hamilton Boulevard was cracked by a skidsteer.

Minor safety violations were noted on several occasions throughout the course of the project, primarily for personnel that did not don the correct PPE. No other accidents, injuries, illnesses, or near-miss events occurred during the project.

S&H inspection forms used during the project include, but were not limited to, the following:

- Certificate of Worker and Visitor Acknowledgment
- Emergency Medical Notification Form
- New Employee Indoctrination for Contractors

- Site Safety and Health Plan Review
- Site Control Log
- Tailgate Safety Meeting Record
- Fire Extinguisher Inspection Checklist
- First-Aid Kit Inspection Checklist
- Heavy Equipment Inspection Report
- Safety Inspection Report
- Calibration Log: Direct-Reading Monitoring Instrument
- Airborne Dust Monitoring Log
- Equipment Decontamination Release Authorization
- Incident Report by Supervisor
- Incident Statement by Employee
- Incident Statement by Witness

6.5.2 Decontamination

A decontamination area was established for cleaning heavy equipment. When soil handling equipment such as excavators, dozers, trucks, or other equipment was no longer needed at the site or was needed at a different location around the site, it underwent gross decontamination. Large dirt clods and debris was removed from equipment by dry procedures (brushes and shovels), and dirtier equipment was cleaned with water from a hose. After decontamination, each piece of equipment was inspected, and an "Equipment Decontamination Release Authorization" form was completed before the equipment was removed from the site and returned to the vendor.

Nondedicated, nondisposable sampling tools and equipment were decontaminated with an Alconox and water solution, followed by a rinse with deionized water.

Personnel decontamination stations were set up adjacent to the excavation areas and were considered the CRZs. The active work areas were considered EZs. Personnel working within the EZs were required to undergo decontamination before exiting the CRZ. Trash cans were located within the CRZ for disposal of used protective clothing.

6.5.3 Exposure Monitoring Summary

PCB air sampling was performed by Maxxam Analytics using perimeter air monitoring equipment during excavation of contaminated soil during excavation. Air monitoring was performed in accordance with the *Community Ambient Air Monitoring Plan CAPE CDE, OU-1 Phase A Remedial Action, South Plainfield, New Jersey 2 September 2005* to ensure compliance with action levels established in the ROD for interior dust. The results of the 2005 air monitoring were well below the action levels, and a determination was made to monitor dust levels using hand held equipment to establish a real time measuring instrument (i.e., dust mass monitor). Air monitoring equipment was maintained and calibrated according to EPA analytical methods and manufacturer's recommendations. A copy of the air monitoring data is provided in Appendix O.

CAPE performed airborne dust monitoring during excavation activities in contaminated areas in 2007. A Thermo PDR-1000 Personal Data RAM monitor was used to monitor

airborne dust concentrations during intrusive activities in the area of contaminants. Monitoring equipment was calibrated daily and recorded on Calibration Log: Direct-Reading Monitoring Equipment forms. Air monitoring results were recorded on Airborne Dust Monitoring Logs.

6.5.4 Standard Safety Procedures

CAPE adhered to the *U.S. Army Corps of Engineers Safety and Health Requirements Manual*, EM 385-1-1, 3 November 2003 version, for all site work. CAPE site personnel and subcontractors performing work at the site received a CDE site-specific safety orientation and a SSHP review briefing for site work. The Hazardous Chemicals Communication Program and Material Safety Data Sheets for chemical products used on the project were maintained in the project office. Heavy equipment was inspected and documented daily by equipment operators for safe operation. Safety inspections were regularly performed by the SSHO, the hazards were identified, and corrective actions taken were documented.

6.5.5 Training

Personnel working on site received a site orientation/SSHP review briefing for site work. Before each new phase of work, the associated activity hazard analysis was reviewed with the crew and affected subcontractors. Hazardous Waste Operations and Emergency Response (HazWOPER) training documentation for site personnel was presented to the SSHO for maintenance in onsite project files.

7.0 FINAL INSPECTION AND CERTIFICATION

A pre-final walkthrough inspection was conducted on May 8, 2007, with CAPE, EPA, and USACE at all four properties. The purpose of the inspection was to develop a punchlist of outstanding work items so that CAPE could address the issues before demobilization and the final inspection. There were no major outstanding tasks, and the items on the punchlist primarily involved site cleanup and restoration. The punchlist items are detailed in Appendix P.

A final inspection at CAPE's laydown area occurred on May 10, 2007, among CAPE, EPA, and a representative of the Borough. No issues or concerns were noted.

Following completion of the remedial activities at each of the sites, CAPE performed walkthrough inspections with each property owner. Construction Release forms signed by the property owners, and in the case of 321 Spicer Avenue, an authorized representative of the property owner, are included in Appendix P.

A final walkthrough inspection was conducted on May 24, 2007, with USACE, CAPE, and EPA. No issues or concerns were noted.

8.0 OPERATION AND MAINTENANCE ACTIVITIES

No operations and maintenance activities are required for this project.

9.0 SUMMARY OF PROJECT COSTS

A summary of the project costs is presented in the table below.

Cost Item	ROD Estimate (2003)[1]	Actual Costs
Capital Cost	$760,000	$824,118
Operation & Maintenance/Year	$0.00	$0
Present Worth	$760,000	$0
Difference between total project cost and total ROD Capital Cost		$64,118 or 8%

[1] Capital Cost and Present Worth obtained from page 25 and from Table 9 (page 47) of the September 30, 2003 ROD

Table 9.0-1 provides details of the project costs.

10.0 SUMMARY OF FIELD CHANGES, DEFICIENCIES, AND OTHER DEVIATIONS

The Work Variance Notification (WVN) process was used to document variances to the project scope and contract requirements. During the course of the project, many WVN's were submitted to USACE, and they included a description of the original requirement versus the proposed change, the technical justification for the proposed change, and the cost and schedule impacts. The USACE reviewed the WVNs and either issued direction to move forward with the deviation, known as an Authority to Proceed (ATP), or rejected the WVNs.

During the execution of the remedial action, field changes resulted in deviation from the original work plan and quality deficiencies resulted in repairs or replacement situations during both field execution periods (i.e., 2005 and 2007). The following deviations and/or quality deficiencies occurred during the completion of this remedial action:

2005 Remedial Action

- Work Plan Deviation (Immunoassay Kit Screening) - CAPE encountered difficulty in delineating the area of contamination at each of the four sites. This was due to wide variations in concentration and limited historical data necessary for adequate site characterization. The sampling methodology planned for use (immunoassay field tests plus laboratory confirmation) did not work as anticipated, and extensive delineation sampling was required to bound the excavation limits. The additional delineation

sampling ultimately resulted in expansion of the originally proposed excavation limits at each site

- Deficiency (Concrete Pad Damage) – , CAPE's backhoe operator accidentally caught the edge of a concrete pad while cutting a trench for silt fence installation. The concrete pad was removed and replaced with sod
- Deficiency (Asphalt Damage) – At during placement of the 20 CY roll-off container for soil, field personnel did not deploy plywood sheeting and a portion of the asphalt driveway was damaged. The edge of the asphalt was dressed up to avoid a jagged edge and sod was placed for final restoration
- Deficiency (Stockpile Covering) – During a rain event, USACE identified that a backfill stockpile was not covered. CAPE personnel quickly installed plastic sheeting over the pile to prevent any further erosion of material
- Deficiency (Sidewalk Protection and Repair) – At , CAPE deployed a 20 CY roll-off container over the sidewalk along Hamilton Boulevard. A steel road plate had been deployed to protect the sidewalk, but during retrieval of the filled container, the sidewalk became damaged from the excessive weight. CAPE replaced the damaged sections of sidewalk and applied a trowel finish. During inspection, USACE identified a possible safety issue with the trowel finish. CAPE returned to repair the sidewalk sections and apply a brushed finish, which alleviated the slipping hazard
- Deficiency (Shrub Health and Alignment) – During a site inspection in the spring of 2006, USACE identified that a number of the arborvitae shrubs were misaligned due to frost heave and a few had not survived the winter. CAPE reinstalled the misaligned shrubs and replaced the dying shrubs.

2007 Remedial Action

- Deficiency (Liner Placement for Stockpiles) - CAPE did not place plastic sheeting on the ground prior to the stockpiling of backfill and topsoil in the laydown area. CAPE monitored stockpiles during loading of the truck to ensure operator did not include existing base material in the clean loads. During laydown area demobilization, backfill material and topsoil were graded to match existing site grades
- Deficiency (Laboratory Coordination): CAPE's subcontract laboratory analyzed samples VS-212 and VS 213 from without authorization. The results for VS-212 and VS 213 were 0.711 and .512 mg/kg, respectively. CAPE collected 3 additional samples from on March 29th to laterally bound the excavation. CAPE received results for the first sample, VS-214, on April 2nd (0.304 mg/kg), which provided the lateral bound for this portion of the excavation
- Deficiency (Historical Data Consolidation and QC on Drafting) - CAPE reviewed the sample summary drawing from the original work plan and identified that a historical sample result was omitted from the original work plan drawings. CAPE notified the USACE and USEPA and incorporated the historical data into the excavation plan
- Deficiency (Heavy Equipment without Fire Extinguishers) - Several pieces of heavy equipment were delivered to the site from rental companies without fire extinguishers. CAPE resolved the deficiency immediately by placing additional 20-pound fire extinguishers in the vicinity of the work area and ordered additional fire extinguishers for the equipment
- Deficiency (Topsoil Compatibility) - Several topsoil samples were collected from various sources in 2007. However, each source failed to meet the criteria for chemical

compatibility by New Jersey RDCSCC or for structural compatibility by American Society for Testing and Materials (ASTM) D5268. CAPE submitted analytical results from a source used for a previous project The data were still valid for the source and upon review by USACE were found to be acceptable for use.

- Due to an increase in the excavation limits at each site, the disposal and restoration quantities also increased.

11.0 OBSERVATIONS AND LESSONS LEARNED

CAPE encountered several obstacles during the course of the project. Excavation was performed at three properties in November 2005, and the limits were based upon historic Tier I and RI sampling data. CAPE used immunoassay field screening kits to delineate excavation areas around historic locations where PCB concentrations exceeded the cleanup criteria. The reliability of the immunoassay test kits were suspect and led to erroneous conclusions regarding the bounding of contaminated areas. CAPE collected pre-excavation confirmation samples in November 2005 from within the excavations; however, inadequate sampling documentation and QC procedures during the 2005 confirmation sampling events rendered the pre-excavation confirmation samples unusable and not defensible. In 2006 and 2007, CAPE re-collected soil samples at these properties to meet NJAC 7:26 sampling requirements. The results of those samples indicated that the original excavation limits did not capture the entire area of contamination. Subsequently, additional excavation was required at three of the properties in 2007 to capture the remaining contamination. The fourth property was not excavated during November 2005 due to the winter season. Additionally, cost growth was incurred due to a late construction season mobilization in 2005, which resulted in lower productivity. Cost growth was also incurred because approval of the waste stream profiles was not in place prior to the commencement of excavation activities. As a result, excavated soil was staged at a transfer facility in rolloffs prior to disposal.

Overall, the project was completed successfully: 2,326.82 tons of nonhazardous, non-TSCA soil and 9.74 tons of construction and demolition debris were removed from the site. Excavated soil was transported off site and disposed in two landfills: Waste Management's G.R.O.W.S. Landfill in Pennsylvania and Allied Waste's Ottawa County Landfill in Ohio. Excavated areas were backfilled with a silty sand material and covered with topsoil, and in some instances, DGA. The sites were restored to their original conditions, including concrete, asphalt, and grassed areas. Trees and shrubs were replaced where needed.

The photo and video recordation of existing conditions prior to the commencement of construction activities proved to be a very useful tool when addressing property damage claims submitted by the property owners where remedial actions were performed. The photo and video recordation demonstrated to the property owners that the property damage existed prior to the commencement of the construction activities.

The remedial action of the four properties identified in the CDE OU-1 ROD was successfully completed from November 2005 through May 2007.

12.0 OPERABLE UNIT 1 (CDE SITE) CONTACT INFORMATION

Contractor for the RA:
CAPE Environmental Management, Inc.
180 Gordon Drive, Suite 105
Exton, PA 19341
(610) 594-8606

Oversight of the RA:
U.S. Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, New Jersey 08816-1910
(732) 846-5830

EPA Remedial Project Manager:
Pete Mannino
290 Broadway Avenue
New York, NY 10007
(212) 637-4395

New Jersey Department of Environmental Protection Case Manager:
Carlton Bergman
Bureau of Design and Construction
401 East State Street
P.O. Box 413
Trenton, New Jersey 08625

13.0 REFERENCES

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